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#2
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17.02.03

Certificate

PATENT OFFICE

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DEPARTMENT OF TRADE
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REC'D 24 FEB 2003

The documents annexed hereto are true copies of:

Application forms P1, provisional specification and drawings
of South African Patent Application No. 2002/0047 as originally filed
in the Republic of South Africa on 03 January 2002 in the name of
VON SEIDEL, MICHAEL; LEVIN, JULIAN for an invention
entitled: "FREEZER FAILURE INDICATOR".

Geteken te
Signed at

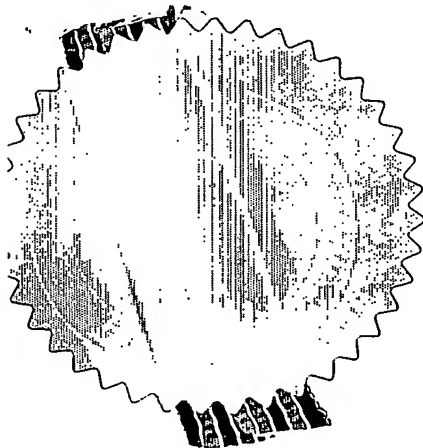
PRETORIA

in die Republiek van Suid-Afrika, hierdie
in the Republic of South Africa, this

15th

dag van
day of

January 2003



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DOCUMENT**
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COMPLIANCE WITH RULE 17.1(a) OR (b)

2/24/03
Registrateur van Patente
Registrar of Patents

FORM P2

REPUBLIC OF SOUTH AFRICA

REGISTER OF PATENTS

PATENTS ACT, 1978

21, 01	Official Application No. 2002/0047	22	Lodging Date : Provisional 2002-01-03	47	Acceptance Date	
51	International Classification	23	Lodging Date : Complete		Granted Date	
71	Full name(s) of Applicant(s)/Patentee(s) VON SEIDEL, Michael LEVIN, Julian					
71	Applicants substituted:			Date registered		
71	Assignee(s)			Date registered		
72	Full name(s) of Inventor(s) VON SEIDEL, Michael					
Priority claimed	33	Country	31	Number	32	Date
54	Title of Invention FREEZER FAILURE INDICATOR					
Address of Applicant(s)/Patentee(s) 10 LECCINO TERRACE, BAKKERSHOOGTE, SOMERSET WEST WESTERN CAPE PROVINCE, 7130 SOUTH AFRICA 6, 5TH AVENUE, EMMARENTIA, JOHANNESBURG GAUTENG PROVINCE, 2195 SOUTH AFRICA						
74	Address for service Michael von Seidel, 10 Leccino Terrace, Bakkershoogte, Somerset West Western Cape Province, 7130 South Africa					
61	Patent of Addition No.			Date of any change		
Fresh Application based on			Date of any change			

FORM P1

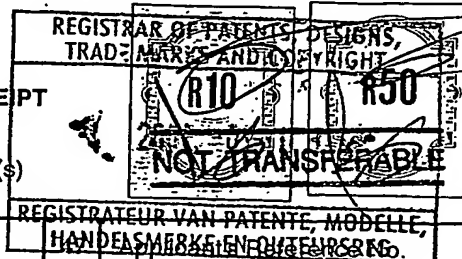
REPUBLIC OF SOUTH AFRICA

PATENTS ACT, 1978

APPLICATION FOR A PATENT AND ACKNOWLEDGEMENT OF RECEIPT

(Section 30(1) - Regulation 39)

The grant of a Patent is hereby requested by the undermentioned applicant(s)
on the present application filed in duplicate



21	01	Official Application No. 2002/0047	22	Lodging Date 2002-01-03	P0139
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71	Full name(s) of applicant(s) VON SEIDEL, Michael LEVIN, Julian
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Address(es) of applicant(s) 10 LECCINO TERRACE, BAKKERSHOOGTE, SOMERSET WEST WESTERN CAPE PROVINCE, 7130 SOUTH AFRICA 6, 5TH AVENUE, EMMARENTIA, JOHANNESBURG GAUTENG PROVINCE, 2195 SOUTH AFRICA

4	Title of invention FREEZER FAILURE INDICATOR
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The applicant claims priority as set out in the accompanying form P2	
The earliest priority is	
This application is for a Patent of Addition to Patent (Application) No.	
This application is a fresh application in terms of S 37 and based on Application No.	

21	01	
21	01	

This application is accompanied by:-

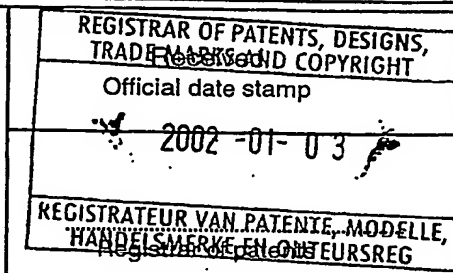
1a	A single copy of a provisional specification of	11	pages
1b	Two copies of a complete specification of		pages
2a	Informal drawings of Nil sheets		
2b	Formal drawings of 2 sheets		
3	Publication particulars and abstract (form P8 in duplicate)		
4	A copy of Figure of the drawings for the abstract		
5	Assignment of invention (from the inventor(s)) or other evidence of title		
6	Certified priority documents (documents)		
7	Translation of priority documents (documents)		
8	Assignment of priority rights		
9	A copy of form P2 and the specification of S.A. Patent Application No.	21	01
10	A declaration and power of attorney on form P3		
11	Request for ante-dating on form P4		
12	Request for classification on form P9		
13a	Request for delay of acceptance on form P4		
13b			

Address for Service: Michael von Seidel, 10 Leccino Terrace, Bakkershoogte, Somerset West Western Cape Province, 7130 South Africa
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Date 28th December, 2001

for the applicant

The duplicate will be returned to the applicant's address for service
as proof of lodging but is not valid unless endorsed with official stamp



FORM P6

REPUBLIC OF SOUTH AFRICA
PATENTS ACT, 1978
PROVISIONAL SPECIFICATION

Section 30 (1) — Regulation 27

21

01

Official application No.

2002/0047

22

Lodging date

2002-01-03

71

Full name(s) of applicant(s)

VON SEIDEL, Michael

LEVIN, Julian

72

Full name(s) of inventor(s)

VON SEIDEL, Michael

54

Title of invention

FREEZER FAILURE INDICATOR

FREEZER FAILURE INDICATOR

5

FIELD OF THE INVENTION

This invention relates to a freezer failure indicator by which term is meant an indicator capable of indicating whether or not a freezer, particularly a freezer
10 used for the storage of foodstuffs, but not necessarily so, has failed during a time period under review to the extent that the contents may have thawed, at least to some extent, and then re-frozen after the cause of the failure had become rectified.

15 BACKGROUND TO THE INVENTION

It is a regular problem for persons who have vacated premises for what may be a relatively long period of time to be certain that a freezer located at such premises has not failed during that time period to an extent that the contents
20 of the freezer thawed, at least to some extent, and then re-froze once the cause of the failure had become rectified.

Freezer failure of the type under consideration can have extremely dire consequences in that frozen food may have become partially or completely
25 thawed for some period of time during which it could develop harmful bacteria or the like after which it becomes re-frozen once the freezer is functional once more. Persons could thus unknowingly consume tainted food and become poisoned by it.

30 Cold storage and other commercial freezers are usually monitored continuously and a record maintained of the temperature of the freezer so

that compliance with cold storage specifications can be checked and authenticated.

However, at a domestic level, and even at the level of small freezers in retail outlets, no such record is maintained and it is not always easy to assess the extent of de-frosting that may have taken place prior to the freezer functioning once more. The condition of frozen foods or other perishables that may have spoiled is often not known.

Many prior art devices have been proposed to indicate when a freezer has failed to the extent that frozen food stored in the freezer could have thawed to an undesirable extent. Some of these are based on the principle that a solid body rests on or in a body of frozen liquid such that if the liquid thaws the solid body will fall to the bottom of the liquid container and will be easily visible as evidence that thawing has occurred. British Patent No 2,235,969 is an example of a device of this type whilst United States Patent No 4,144,532 is an example of a more sophisticated version of this type of device in which the weight closes an electric circuit when it falls to the bottom. A reverse principle is employed in United States Patent No 4,064,828 in which a buoyant indicator is locked within a frozen liquid and if the liquid thaws the buoyant indicator rises.

Other devices simply operate on the locking of a frozen body of liquid in an upper position such that it flows downwards, or in one case laterally, if thawing takes place. The frozen body of liquid is generally created by freezing the liquid in the device with the latter in one orientation and then subsequently inverting the device so that the frozen body of liquid is then uppermost. Some of the devices choose to select liquids with different freezing points, and indeed some use multiple liquid indicators with different freezing points to indicate the degree of the freezer failure. Examples of these devices are German Patents 3,940,163 and 4,418,927 and United States Patents 4,114,443 and 4,941,425.

Other devices such as that described in European published patent application EP 0 740 136 A1 and applicants' own international patent application published under No WO 01/73388 A1 describe indicators that utilize a non-freezing liquid, in particular an organic liquid such as paraffin, and an immiscible aqueous liquid. With the aqueous liquid frozen and the indicator inverted the organic liquid which can typically be coloured green is visible in the lower region of the indicator and in the event of thawing taking place, the aqueous liquid that is typically coloured red replaces it and becomes visible to indicate the failure.

All of these devices are more or less relatively complicated, difficult to manufacture, or do not clearly indicate the failure because they employ a single colour or solid object with only its position changing. In the case of our earlier international patent application the problem of the use of a single colour was overcome but the use of two immiscible liquids proved to be inconvenient because the most advantageous organic phases that were found to exhibit a satisfactory partition coefficient are accompanied by possible toxicity that would be undesirable in an application involving food. Also, assembly of the particular embodiment of indicator described in that earlier patent application proved to be difficult in view of the physical and chemical properties of the organic phase.

OBJECT OF THE INVENTION

It is accordingly an object of the invention to provide a simple freezer failure indicator device that can be easily manufactured and which, in use, makes it easy to see a change that is occasioned in the event of thawing taking place.

SUMMARY OF THE INVENTION

In accordance with this invention there is provided a freezer failure indicator assembly comprising an indicator unit in the form of a closed container defined by walls forming an internal cavity containing a quantity of a liquid having a freezing point selected so that it will be frozen at normal operating temperatures of a freezer with which it is to be used and wherein the walls of the container have an opaque zone and a transparent zone arranged to enable the liquid to be pre-frozen within the opaque zone followed by orientating the container to render the transparent zone of the wall visible and devoid of any liquid in such zone, colour imparting means for imparting a first colour to the transparent zone in the absence of any liquid being present in the transparent zone and the liquid having a second colour chosen to provide a colour indication distinctly different from said first colour when the liquid is present in the transparent zone.

Further features of the invention provide for the container to be of upright shape capable of being supported in either of two possible generally vertical orientations; for the assembly to include a support bracket or clip for supporting the indicator unit on the inside wall of a freezer for example; for the indicator unit to have a flange at each end thereof for cooperation with a support bracket or clip to inhibit longitudinal movement of the indicator in the support bracket or clip; and for the liquid to be water or water, the freezing point of which has been modified by the addition of additives such as alcohol, salt or other freezing point depressants.

Still further features of the invention provide for the colour imparting means to be either a colour carried by a surface of a bracket that operatively supports the indicator unit and that is visible through the said transparent zone in which case the liquid is rendered opaque so as to obscure such coloured surface when the liquid is present in the transparent zone, or,

alternatively, for the transparent zone to be tinted to exhibit said first colour in which case the colour of the liquid is selected to cooperate with the colour of the transparent zone to provide a composite second colour, and in this case, the liquid may be either transparent or opaque.

5 The opaque portion of the side walls preferably extends from one end of the container for about two-thirds to three quarters of the height of the container whilst the rest of the height defines the said transparent zone. The liquid, is preferably coloured red, or at least a colour that will provide a red or reddish
10 composite colour in the instance that the transparent zone is tinted as indicated above. The first colour is preferably a blue or green colour to indicate that there has been no thawing of the freezer contents when the liquid is absent from the transparent zone. Obviously any other indicative colours may be chosen. The functioning of this indicator will be described in
15 more detail hereunder.

In order that the invention may be more fully understood one embodiment thereof will now be described with reference to the accompanying drawings.

20 **BRIEF DESCRIPTION OF THE DRAWINGS**

In the drawings:-

25 Figure 1 is a sectional elevation of one embodiment of indicator unit according to the invention;

Figure 2 is a similar sectional elevation illustrating the indicator unit in a pre-frozen and inverted orientation;

Figure 3 is an elevation of the indicator unit installed in a supporting bracket to form one embodiment of freezer failure indicator assembly of the invention;

5 Figure 4 is an elevation of the indicator assembly shown in Figure 3 and indicating the appearance of the indicator unit after a failure has occurred;

10 Figure 5 is an exploded isometric view showing one form of supporting bracket wherein the colour imparting means is a colour applied to the bracket and visible through the transparent zone of the indicator unit described with reference to Figures 1 to 4;

15 Figure 6 is an oblique projection of a variation of the bracket illustrated in Figure 5; and,

20 Figure 7 is a similar oblique projection of a bracket for utilization in combination with an indicator unit whereof the transparent zone is tinted to provide said colour imparting means for imparting said first colour.

DETAILED DESCRIPTION WITH REFERENCE TO THE DRAWINGS

25 In the embodiment of the invention illustrated in Figures 1 to 5 the freezer failure indicator assembly includes an indicator unit in the form of a permanently closed container (1) formed of two parts of injection moulded plastics material the one part (2) being of opaque plastic, conveniently appliance white for example, and the other part (3) being of transparent
30 plastics material. Each of the two parts (2) and (3) is of a right circular

cylindrical shape having at its free end an integral flange (4) of sufficient dimensions to act as an end stop as will be further described below.

5 The two parts are configured such that the opaque part extends for at least a half preferably about two-thirds to three quarters of the overall height of the container and the two parts overlap somewhat to enable them to be adhesively secured to each other in leak-proof manner. Alternatively, the two parts may be ultrasonically welded together or permanently secured together in any other way. Effectively, the container is thus opaque for about
10 two-thirds to three quarters of its height.

Prior to the two parts being permanently secured together, there is introduced into them a volume of water (5) that is given said second colour that is conveniently red or, is adapted to cooperate with a tinted transparent
15 zone as will be further described hereinafter to provide a reddish colour. The water optionally has its freezing point modified to depress it if this is required for any particular reason. It is envisaged that for general use on a domestic level or by small retailers, the usual freezing point of water will be adequate. The volume of water fills about 30% to 40% of the height of the container and is, in any event, sufficient to fill the transparent part (3) when it is
20 lowermost and the water is in a liquid state.

The balance of the volume of the container indicated by numeral (6) is filled with air which accommodates the expansion and contraction of the volume of
25 water when it freezes or thaws and thereby subjects the indicator unit to a minimum of stress caused by such expansion and contraction.

The indicator unit is to be supported in a freezer by means of a bracket or clip to be attached to an internal wall of the freezer to form the composite
30 failure indicator assembly. In this manner the indicator does not occupy any significant potential storage space in the freezer and will not be knocked over or be in the way.

A simple device is shown in Figure 5 in which a clip (8) of channel shape in cross-section has a self-adhesive mounting pad (9) on the outside of its web portion (10). The free edges of the flanges (11) have inwardly directed lips (12) so that the indicator unit can be clipped into the channel and removed therefrom very easily. In this regard it is to be noted that the flanges (4) on the container itself will act as stops and prevent the container from falling out in the event that the clip fails to engage the outside walls of the container adequately.

In the embodiment of the invention illustrated in Figures 1 to 5, the inside surface of the channel, indicated by numeral (13) has applied thereto a coating or layer of colour imparting material in order to provide said first colour as being visible through the transparent part (3). The said first colour is preferably a suitable blue that is associated with freezing temperatures but may also be a suitable green. As illustrated in Figure 3 the blue or green colour is visible when the water is absent from the transparent zone.

In this implementation of the invention the water is rendered opaque and red in colour so that when it occupies the transparent zone it will obscure the first colour of the inside surface of the bracket and itself be highly visible and obviously apparent by giving the transparent zone a bright red colour.

For use the freezer failure indicator described above may be provided with suitable indicia and instructions applied to the outer surface thereof to indicate the orientation of the container for the purposes of use in the manner described below.

In order to prepare the indicator assembly for use the bracket is firstly attached to a suitable area within a freezer where it is out of the way but clearly visible. A preferred position is the inside of the door of a freezer at approximately eye-level when the freezer door is opened. The indicator unit

is then introduced into the bracket in the orientation illustrated in Figure 1, ie with the opaque part (2) lowermost. The volume of water (5) will therefore freeze in the opaque end of the container. In order to render the indicator unit functional it is then inverted to the orientation illustrated in Figure 2 with the opaque part (2) uppermost and the frozen water (5) locked in position within it. The frozen water is thus held in an elevated position whilst the blue or green colour of the inside surface of the bracket is visible through the lower transparent part (3) as shown clearly in Figure 3. The blue or green first colour applied to the inner surface of the bracket will thus be visible thereby indicating that there has been no harmful freezer failure.

In the event of freezer failure which results in the water (5) thawing, the water will fall down into the lower end of the container to exhibit its red colour through the transparent zone and simultaneously obscuring the colour of the inside of the bracket. Such a condition is illustrated in Figure 4. The presence of the red opaque colour of the water in the transparent zone will be most noticeable in that there has been a distinct colour change from blue or green to red. With white as the colour of the opaque part and the bracket (other than the colour applied to its inner surface) the colours are particularly noticeable.

Figure 5 illustrates the entire inner surface of the channel being coloured as described above but, as illustrated in Figure 6, the colour may be applied only for a section of the length of the bracket corresponding to that in alignment with the transparent zone of the indicator unit when said transparent zone is lowermost as indicated by numeral (14).

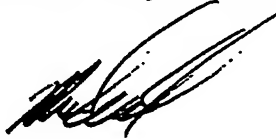
As an alternative to providing the inner surface of the bracket with a colour in order to define said colour imparting means, the inner surface may be left, for example white, as indicated by numeral (15) in Figure 7 and the transparent part of the indicator unit could be tinted, for example blue. In such a case the blue colour of the tinted transparent part, against the white

interior of the bracket, or the white interior of a freezer, will constitute said first colour. In this case the water in the indicator unit may be either opaque or transparent and have a colour chosen to provide a reddish colour when viewed through the transparent zone with the blue tint. Simply by way of example, it is envisaged that with a 20 percent cyan tint applied to the transparent part a satisfactory indicating second colour is achieved if the colour of the water corresponds to 100 percent magenta and between 20 and 40 percent yellow.

- 10 The embodiments of the invention described above can be varied in many ways without departing from the scope hereof which is limited only to the use of a single liquid in an indicator unit and the provision of a second colour that becomes obscured by the liquid or combines of the colour of the liquid to provide an indication of freezer failure.

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Dated this 28th day of December 2001



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for the applicants

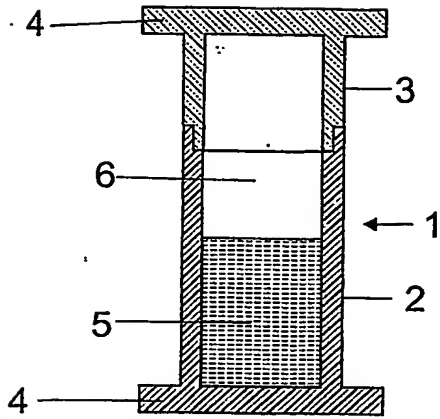


Fig 1

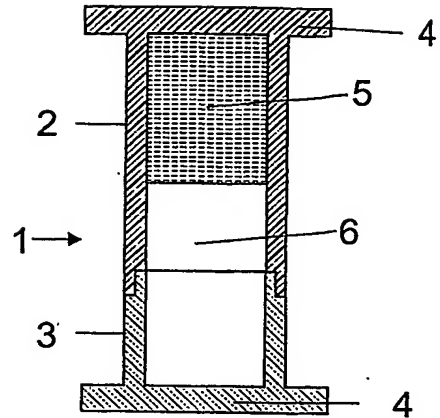


Fig 2

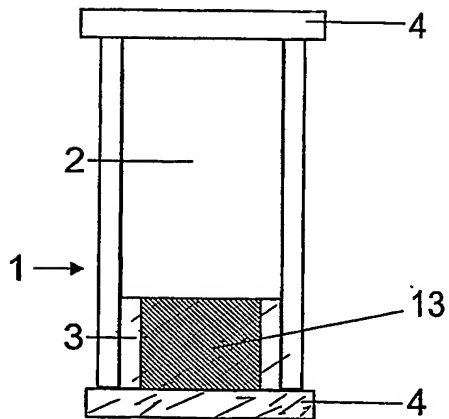


Fig 3

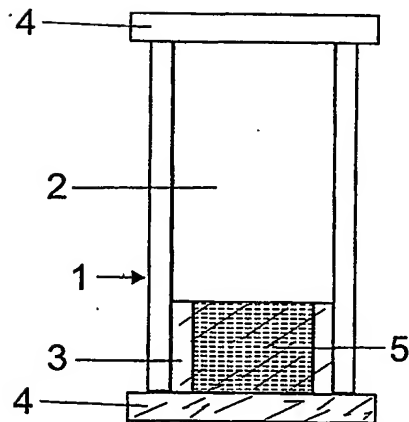
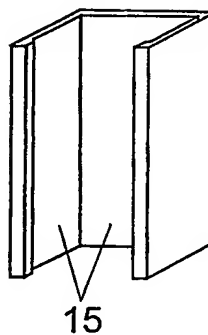
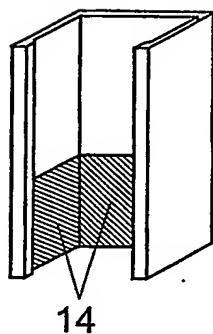
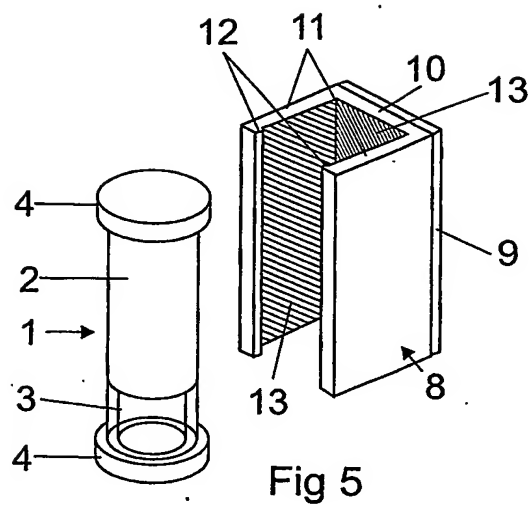


Fig 4

for the applicants



Julian Levin
for the applicants